

Office Action Summary

Application No.

08/866,129

Applicant(s)

UEMURA ET AL.

Examiner

Douglas A Wille

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-14 and 20-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-14,20-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION

New Matter

1. The amendment filed 5/29/01 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: Claims 29 and 31 refer to the formation of an oxide and this is not supported by the specification.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 102

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 12 - 14, 21, 27, 28 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakamura et al. ('422)
4. With respect to claims 12 - 14, Nakamura et al. ('422) show a group III compound semiconductor device (see Figure 1) with a p-type upper layer 13 and an electrode consisting of a layer of Ni with a layer of Au on top (column 5, line 49). Figure 7 shows a modification of the Figure 1 device which has a contact layer 15 and a bonding pad 17 that covers part of layer 15 and has a protective film of silicon oxide (column 10, line 26). The other properties in claim 12 are inherent in the materials. The limitations of claims 28 and 30 are inherent in the process shown. With respect to claim 27, note that the composition of the atmosphere is a processing limitation and carries no weight in claims drawn to a device

5. With respect to claim 21, Nakamura ('422) shows a structure with an AuNi layer covering part of a Ni and Au layer and will inherently have the same properties as claimed.

Claim Rejections - 35 USC § 103

6. Claims 1, 2, 4 - 11, 20 and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. ('422) in view of Manabe et al. and Nakamura et al. ('350).

7. Nakamura et al. ('422) show a group III compound semiconductor device (see Figure 1) with a p-type upper layer 13 and an electrode consisting of a layer of Ni with a layer of Au on top (column 5, line 49). Figure 7 shows a modification of the Figure 1 device which has a contact layer 15 and a bonding pad 17 that covers part of layer 15 and has a protective film of silicon oxide (column 10, line 26). Nakamura et al. ('422) show that the electrode layers are transparent (column 6, line 31). Nakamura et al. ('422) also show that the bonding pad 17 is composed of Ni and Au but teach against the use of Al (in a two layer structure) since it can migrate to the electrode and can degrade it. Manabe et al. show the use of Al in a multilayer electrode stack (see Figure 6 and column 5, line 38) which has improved operating characteristics. It would have been obvious to modify the Nakamura et al. ('422) device to include the Al layer as taught by Manabe et al. with the expectation that the two intervening layers will protect the electrode from deterioration. Nakamura et al. ('422) also teach annealing at 600 degrees (column 7, line 38) and teach the LED compound is $\text{In}_x\text{Al}_y\text{Ga}_{1-x-y}\text{N}$. Nakamura et al. ('350) show that the silicon oxide protective layer is SiO_2 (column 34, line 66). The remainder of the claimed features are inherent in the choice of materials. Forming the layers in the sequence Ni-Au-Al follows the decreasing sequence of work functions and would also be obvious.

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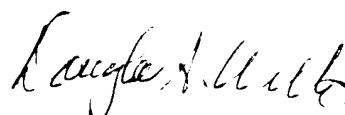
8. With respect to claim 20, Nakamura ('422) shows a structure with an AuNi layer covering part of a Ni and Au layer and will inherently have the same properties as claimed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A Wille whose telephone number is (703) 308-4949. The examiner can normally be reached on M-F (6:15-3:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Douglas A. Wille
Patent Examiner

daw
July 18, 2001